

AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1. (Currently Amended) A fastener assembly comprising:

a nut having a generally cylindrical body with a constant radius;
a base and a transition portion coupling the base to the body, the nut and base defining a throughbore having a throughbore axis, the throughbore including a countersink surface, the countersink surface being conical and having a cross-section parallel to the throughbore axis ~~that defines a flat surface~~, which corresponds to the transition portion, the base having a base minimum thickness, and the transition portion having a transition minimum thickness greater than the minimum base thickness; and
an integral member defining a first opening on a first surface and second opening on a second surface, the integral member disposed around the base operably allowing some movement of the nut associated therewith but limiting the movement of the nut.

2. (Currently Amended) A cage nut assembly comprising:

a nut having a body, a depending base and a transition portion coupling the base to the body, the body and base defining a bore having a bore axis, the bore including a countersink surface, the countersink surface being conical and having a cross-section parallel to the throughbore axis ~~that defines a flat surface~~, which corresponds to the transition portion, the body having a constant body minimum

thickness, and the transition portion having a transition minimum thickness greater than the body minimum thickness; and

an integral cage disposed around a substantial portion of said base, wherein the integral cage provides a limited range of movement of the nut within the integral cage and defines a first opening on a first surface and second opening on a second surface at least partially aligned with the bore.

3. (Currently Amended) An automotive vehicle assembly comprising:

an automotive vehicle component;
a nut having a body and depending base and a transition portion coupling the base to the body, the body and base defining a bore having a bore axis through the body and base, the base including a countersink surface formed at the transition portion, the countersink surface having a conical cross-section parallel to the bore axis ~~that defines a flat surface~~, which corresponds to the transition portion, the base having a base minimum thickness, the body having a constant body minimum thickness, the transition portion having a minimum thickness greater than the body minimum thickness and greater than the base minimum thickness, the nut being a medium carbon steel Class 10 fastener; and

an integral cage disposed around a substantial portion of said base, the integral cage defining a first opening in a first surface and a second opening in a second surface, wherein the integral cage provides a limited range of movement of the nut within the integral cage, the integral cage being welded to the component.

4-5. (Cancelled)

6. (Original) The automotive vehicle assembly in accordance with Claim 3 wherein the body comprises a planar base and wherein the cage defines a pair of flanges which covers at least a portion of the base.

7. (Original) The automotive vehicle assembly in accordance with Claim 3 wherein the body has an exterior surface which is generally cylindrical in shape, the exterior cylindrical surface mates with an upper surface of the base, the interface of the exterior cylindrical surface and the upper surface is a defined concave radius; and wherein the nut defines a through bore, said through bore having a threaded region and at least one countersink.

8. (Withdrawn) The automotive vehicle assembly in accordance with Claim 3 wherein the body has an exterior surface which is generally cylindrical in shape, the exterior cylindrical surface mates with an upper surface of the base, the interface of the exterior cylindrical surface and the upper surface is a defined concave radius; and wherein the nut defines a through bore, said through bore having a threaded region and at least one countersink.

9. (Withdrawn) The automotive vehicle assembly in accordance with Claim 3 wherein the wall minimum thickness of the base, the body and the transition portion are substantially constant throughout.

10. (Currently Amended) A fastener comprising:

a one piece nut having a body and depending base, and a transition portion defined between the body and the base to couple the body to the base, the depending base having a base minimum thickness, the body having a constant body minimum thickness, and a bore defined through the body, the transition portion and the base that has a bore axis, the bore including a countersink surface between the body and the base that corresponds to the transition portion, the countersink surface being a conical surface ~~having a cross-section parallel to the bore axis that defines a flat surface~~; and

an integral cage having an upper surface and a lower surface, the integral cage defining an upper opening on the upper surface, a lower opening on the lower surface, and two pair of flanges bent to enclose at least a portion of the base,

wherein the minimum wall thickness of the transition portion is greater than the minimum thickness of the base.

11. (Cancelled)

12. (Original) The fastener of Claim 10 wherein the base is disposed on the upper surface of the cage.

13. (Withdrawn) The fastener of Claim 10 wherein the bore comprises a convex countersink surface.

14. (Cancelled)

15. (Original) The fastener of Claim 10 wherein the nut has a proof load of at least 100 mega-pascal.

16. (Currently Amended) A fastener comprising:

a nut having a body with a constant minimum thickness, the nut being a medium carbon steel Class 10 fastener;

a transversely extending base;

a transition portion that couples the body to the base, the body, the base and transition portion defining a bore having a bore axis therethrough, the bore including a countersink surface aligned with the transition portion that spans the entire transition portion, the countersink surface having a cross-section parallel to the bore axis that defines a flat conical surface, wherein a wall minimum thickness of the transition portion is greater than a minimum thickness of the base and greater than the minimum thickness of the body; and

an integral cage having an upper surface and a lower surface, the integral cage defining an upper opening on the upper surface, a lower opening on the lower surface, and two pair of flanges bent to enclose at least a portion of the base.

17. (Currently Amended) A fastener comprising:

a nut having a body and depending base and transition portion, the body and base defining a bore having a bore axis, the bore including a flat conical

~~countersink surface which has a flat cross section which is parallel to the bore axis,~~
wherein a minimum wall thickness of the transition portion is greater than a constant
minimum thickness of the body; and

an integral cage having an upper surface and a lower surface, the integral
cage defining an upper opening on the upper surface, a lower opening on the lower
surface, and two pair of flanges bent to enclose at least a portion of the base.

18. (Cancelled)

19. (Original) The fastener of Claim 18 wherein the base is disposed on
the upper surface of the cage.

20. (Withdrawn) The fastener of Claim 17 wherein the bore comprises a
convex countersink surface.

21. (Cancelled)

22. (Original) The fastener of Claim 17 wherein the body is a cylinder.

23. (Withdrawn) The fastener of Claim 22 wherein the cylinder is tapered
cylinder.

24. (Currently Amended) A fastener for coupling to an automotive structure, the fastener comprising:

a body having a constant thickness, defining a threaded bore having a bore axis therethrough, a transition portion and a base, said threaded bore having a countersink surface formed between the base and the body and corresponding to the transition portion of the body, the countersink surface having a cross-section parallel to the bore axis that defines a flat conical surface, ~~the countersink surface having a first countersink diameter opposite the body,~~ the countersink surface being configured to guide threaded fasteners into the threaded bore; and

an integral cage having an upper surface and a lower surface, the integral cage defining an upper opening on the upper surface, a lower opening on the lower surface, and two pair of flanges bent to enclose at least a portion of the base.

25-26. (Cancelled)

27. (Previously Presented) The fastener of Claim 24 wherein the cage is defined on the automotive component.

28. (Previously Presented) The fastener of Claim 24 wherein the body is a class 10 fastener.

29. (Previously Presented) The fastener of Claim 24 wherein the base is a planar base.

30. (Previously Presented) The fastener of Claim 24 wherein the body has an exterior surface which is generally cylindrical in shape, the exterior cylindrical surface mates with an upper surface of the base, and the interface of the exterior cylindrical surface and the upper surface is a defined concave radius.

31. (Cancelled)

32. (Previously Presented) The fastener of Claim 30 wherein the body is formed by a hot forming process.

33. (Previously Presented) The fastener of Claim 30 wherein the body is formed by a cold forming processes.

34. (Previously Presented) The fastener of Claim 30 wherein the body is heat treated.

35-37. (Cancelled)

38. (Previously Presented) The fastener construction of Claim 54 wherein the member has an upper surface and a pair of flanges configured to enclose at least a portion of said body.

39. (Previously Presented) The fastener construction of Claim 54, wherein the member is defined on the component.

40. (Previously Presented) The fastener construction of Claim 54, wherein the body is converted to a Class 10 fastener by hot forming operations.

41. (Previously Presented) The fastener construction of Claim 54 wherein the base is planar and wherein the member covers at least a portion of the base.

42. (Withdrawn) The fastener construction of Claim 36 wherein the body has an exterior surface which is generally cylindrical in shape, the exterior cylindrical surface mates with an upper surface of the base, and counter bore is a defined convex radius.

43. (Cancelled)

44. (Previously Presented) The fastener construction of Claim 54 wherein the body is formed by a hot forming process.

45. (Previously Presented) The fastener construction of Claim 54 wherein the body is formed by a cold forming processes.

46. (Previously Presented) The fastener construction of Claim 54 wherein the body is heat treated.

47. (Cancelled)

48. (Withdrawn) A method of forming a fastener comprising:

hot forming a nut having a cylindrical body with an integral base, further forming a transition portion between the base and the body, the transition portion having a thickness which is greater than a thickness of the body; and
forming a cage about the nut.

49. (Currently Amended) A fastener assembly comprising:

a nut having a generally cylindrical body with a constant minimum body thickness and formed of a medium carbon steel, the body of the nut having a first diameter and defining a bore having a bore axis;

a base and a transition portion coupling the base to the body, the base having a base minimum thickness, and the transition portion having a transition minimum thickness greater than the minimum base thickness, said transition portion defining a conical surface, the conical surface on a first side of the conical surface having a first conical diameter opposite the body, which is greater than the first diameter, ~~the countersink surface having a cross-section parallel to the bore axis that defines a flat surface~~; and

a member operably allowing some movement of the nut associated therewith but limiting the movement of the nut by enclosing at least a portion of the base, the member defining a first opening on a first surface and a second opening on a second surface.

50. (Currently Amended)

A cage nut assembly comprising:

a nut having a body, a depending base and a transition portion coupling the base to the body, the body and base defining a bore having a bore axis, the body having a constant body minimum thickness, and the transition portion having a transition minimum thickness greater than the body minimum thickness, said transition portion defining a surface, the surface having a cross-section parallel to the bore axis that defines a flat conical surface; and

a cage disposed about at least a portion of said base, wherein the cage provides a limited range of movement of the nut within the cage and defines first aperture on a first surface and a second aperture on a second surface at least partially aligned with the bore.

51. (Currently Amended)

A fastener comprising:

a one piece nut having a body defining a bore having a bore axis and a minimum thickness, a depending base, and a transition portion having a generally conical bore coaxial with the bore of the body, the conical bore having a cross-section parallel to the bore that defines a flat conical surface, the transition portion coupling the body to the base, the depending base having a base minimum thickness; and

a cage operable to enclose at least a portion of the base to restrict the motion of the nut, the cage defining a first opening on a first surface and a second opening on a second surface,

wherein the minimum wall thickness of the transition portion is greater than the minimum thickness of the base.

52. (Currently Amended) A fastener comprising:

a nut having a body;

a transversely extending base;

a transition portion, wherein a wall minimum thickness of the transition portion is greater than a minimum thickness of the base and greater than a constant minimum thickness of the body, the body, the base and the transition portion defining a bore having a bore axis, said bore defining a surface at the transition portion, the surface having a cross-section parallel to the bore axis that defines a flat conical surface; and

a cage operable to enclose at least a portion of the base to restrict the motion of the nut, the cage defining a first opening on a first surface and a second opening on a second surface.

53. (Currently Amended) A fastener construction for coupling a fastener to component, said component defining a hole having a first diameter, the fastener construction comprising:

a body defining a threaded bore having a bore axis therethrough, said threaded bore having a second radius and countersink having a first countersink diameter opposite the body, the countersink diameter smaller than or equal to the first diameter, the countersink has a cross-section parallel to the bore axis that defines a flat conical surface to guide threaded fasteners into the threaded bore;

a depending base and a transition portion coupling the base to the body, the base defining a conical bore, the conical bore coaxial to the threaded bore, the base

having a constant base minimum thickness and the body having a body minimum thickness, the transition portion having a transition minimum thickness greater than the body minimum thickness and the base minimum thickness, the depending base, transition portion and body comprising a medium carbon steel Class 10 fastener;

a fastener disposed through the hole and within a portion of the threaded bore; and

a means for regulating the movement of the body with respect to the hole by enclosing at least a portion of the base, and defining a first opening on a first surface and a second opening on a second surface aligned with the hole.

54. (Currently Amended) A fastener construction for coupling a fastener to component, said component defining a hole, the fastener construction comprising:

a body defining a threaded bore having a bore axis therethrough, the body having a first diameter;

a depending base and a transition portion coupling the base to the body, the base defining a bore coaxial to the threaded bore, the base having a base minimum thickness and the body having a body minimum thickness, the transition portion having a transition minimum thickness greater than the body minimum thickness and the base minimum thickness, the transition portion including a bore having a countersink surface coaxial to the threaded bore, the countersink surface having a first countersink diameter adjacent to the base which is greater than the first diameter, the countersink surface having a cross-section parallel to the bore axis that defines a flat conical surface;

a fastener disposed through the hole and within a portion of the threaded bore; and

an integral member which regulates the movement of the depending base with respect to the hole by enclosing a portion of the base, the integral member defining a first opening on a first surface and a second opening on a second surface, the integral member welded to the component.